KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VP-441

Presentation Switcher/Scaler

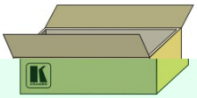
P/N: 2900-300040 Rev 5

VP-441 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ☑ The **VP-441** Presentation Switcher/Scaler
- ☑ IR remote control transmitter with batteries
- ☑ 1 Power cord
- ☑ 4 Rubber feet
- ☑ 1 Set of rack ears
- ☑ 1 Quick start guide



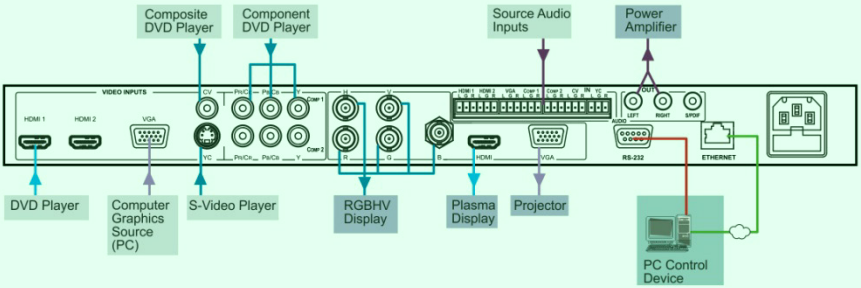
Save the original box and packaging materials in case you need to return your product for service.

Step 2: Install the VP-441

Mount the machine in a rack or place on a table.

Step 3: Connect inputs and outputs

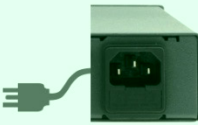
Always switch OFF the power on each device before connecting it to your **VP-441**.



For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VP-441**.

Step 4: Connect the power

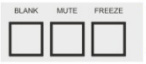
Connect AC power to the rear of the **VP-441**, switch on its power and then switch on the power on each device.



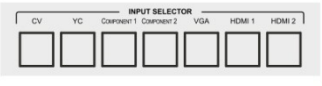
Step 5: Operate via the front panel buttons and the remote control transmitter

Push the MENU button to access the menu and show the main menu on your display.

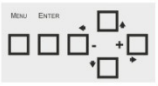
Toggle between blank and display.
Toggle between mute and the audio output.
Freeze/unfreeze the output image.



Select an input



Press the MENU button to access the menu.The arrow buttons and ENTER (OK) button let you navigate within the OSD menu. Press EXIT to exit the menu.



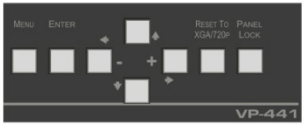
POWER
Cycles power

Reset the output resolution

If you cannot see an image, verify that the output cable to your display, TV, or projector is in good working order and is connected to the **VP-441** and/or reset the output resolution.

Step 6: Configure the VP-441 via the OSD menu

Press the MENU button to open the OSD menu:



Contents

1	**Introduction**	**1**
2	**Getting Started**	**2**
2.1	Achieving the Best Performance	2
2.2	Recycling Kramer Products	2
3	**Overview**	**3**
3.1	Defining the VP-441 Presentation Switcher/Scaler	4
4	**Installing in a Rack**	**7**
5	**Connecting the VP-441**	**8**
6	**Controlling the VP-441**	**10**
6.1	Controlling via the Front Panel Buttons	10
6.2	Using the OSD Menu	11
6.3	Connecting to the VP-441 via RS-232	14
6.4	Connecting the VP-441 via the ETHERNET Port	14
6.5	Controlling via the Infrared Remote Control Transmitter	15
7	**Technical Specifications**	**16**
7.1	Input Resolutions	17
8	**RS-232 Communication Protocol**	**18**
8.1	RS-232 Protocol Table	19

Figures

Figure 1: VP-441 Presentation Switcher/Scaler Front Panel 5
Figure 2: VP-441 Presentation Switcher/Scaler Rear Panel 6
Figure 3: Connecting the VP-441 Presentation Switcher / Scaler 9
Figure 4: Infrared Remote Control Transmitter 15

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Video Products.

Congratulations on purchasing your Kramer **VP-441** Presentation Switcher/Scaler. This product, which incorporates HDMI™ technology, is ideal for:

- Projection systems in conference rooms, boardrooms, hotels and churches
- Home theater up-scaling

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables
- Use only the power cord that is supplied with this machine

Go to http://www.kramerelectronics.com to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VP-441** away from moisture, excessive sunlight and dust

2.2 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at *http://www.kramerelectronics.com/support/recycling/*.

3 Overview

The Kramer **VP-441** is a high quality presentation switcher and scaler. It accepts one of seven inputs: a component video on RCA connectors, computer graphics on a 15-pin HD connector, composite video on an RCA connector, s-Video on a 4-pin connector and two HDMI signals. It scales the video, embeds the audio, and outputs the signal as follows: to the HDMI output, to the computer graphics output, and to the RGBHV video output together with a digital audio output and an analog stereo audio output.

Component video is also known as Y, Pb, Pr, or Y, Cb, Cr or YUV; compatible with both SD and HD component

The **VP-441** is HDTV compatible and the resolution can be up- or down-scaled as follows: Native, VGA, SVGA, XGA, SXGA, UXGA, 480i, 480p, 576i, 576p, 720p (@50 and 60Hz), 1080i (@50 and 60Hz), 1080p (@50 and 60Hz), WXGA, WSXGA, WUXGA, 1280x800, 1440x900, 1400x1050, 1600x900 and 2K resolutions (2048x1080@50Hz and 2048x1080@60Hz).

The **VP-441** Presentation Switcher / Scaler:

- Features K-Storm™ Scaling Technology - Kramer's extremely high performance scaling technology. High-quality 3:2 and 2:2 pull down de-interlacing and full up and down scaling of computer graphics video input signals
- Has analog audio inputs and digital (S/PDIF) and analog stereo audio outputs as well as 5.1 analog audio bypass

  The **VP-441** converts digital audio information to Dolby 5.1 analog outputs, facilitating the routing of up to six analog audio inputs (left, center, right, left surround, right surround and subwoofer) directly to the output without being processed
- Automatically detects and selects the audio source for the HDMI input. Default selection is HDMI – if this is not present, the machine uses the audio from the analog input
- Comes with an On-Screen Display (OSD) for easy setup and adjustment, accessible via the IR remote control and via the front-panel buttons
- Has an HDTV compatible component input

- Is HDCP Compliant - The HDCP (High Definition Content Protection) license agreement allows copy-protected data on the HDMI input to pass only to the HDMI output
- Has a non-volatile memory that retains the last settings used
- Supports firmware upgrade via RS-232

Control your **VP-441**:

- Directly, via the front panel push buttons
- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Remotely, from the infrared remote control transmitter
- Via the Ethernet

The **VP-441** is housed in a 19" 1U rack mountable enclosure, with rack "ears" included, and is fed from a 100-240 VAC universal switching power supply.

3.1 Defining the VP-441 Presentation Switcher/Scaler

This section defines the **VP-441**.

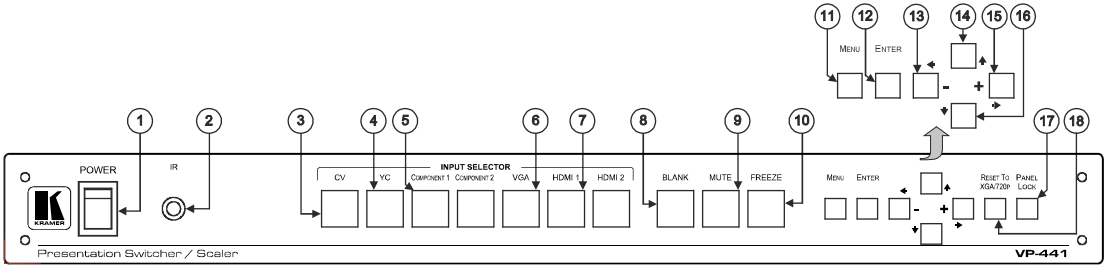


Figure 1: VP-441 Presentation Switcher/Scaler Front Panel

#	Feature		Function
1	*POWER* Switch		Illuminated switch for turning the unit ON or OFF
2	*IR* Receiver		Receives signals from the remote control transmitter
3	*INPUT SELECTOR* Buttons	*CV*	Press to select the composite video input
4		*YC*	Press to select the s-Video input
5		*COMPONENT*	Press to select the component video input (from 1 to 2)
6		*VGA*	Press to select the computer video graphics input
7		*HDMI*	Press to select the HDMI input (from 1 to 2)
8	*BLANK* Button		Press to toggle between a blank screen (blue or black screen) and the display
9	*MUTE* Button		Press to toggle between muting (blocking out the sound) and enabling the audio output The FREEZE button can be programmed to follow MUTE (see Section 6.2.3)
10	*FREEZE* Button		Press to freeze/unfreeze the output video image This button can be programmed to follow MUTE (see Section 6.2.3)
11	*MENU* Button		Displays the OSD menu (see Section 6.2)
12	*ENTER* Button		Press to accept changes, change the SETUP parameters (see Section 6.2) and to auto adjust the image (when not within the OSD menu), see Section 6.1.1
13	- ⬅ Button		Press to decrease numerical values or select from several definitions. For convenience and speed—when not within the OSD menu mode—press to reduce volume
14	⬆ Button		Press to move up the menu list values (see Section 6.2)
15	+ ➡ Button		Press to increase numerical values or select from several definitions. For convenience and speed—when not within the OSD menu mode—press to increase volume
16	⬇ Button		Press to move down the menu list (see Section 6.2)
17	*PANEL LOCK* Button		Press and hold for about 2 seconds to lock/unlock the front panel buttons
18	*RESET TO XGA/720p* Button		Press to reset the video resolution to XGA or 720p Press and hold for about 2 seconds to reset to XGA; or press and hold for about 5 seconds to reset to 720p

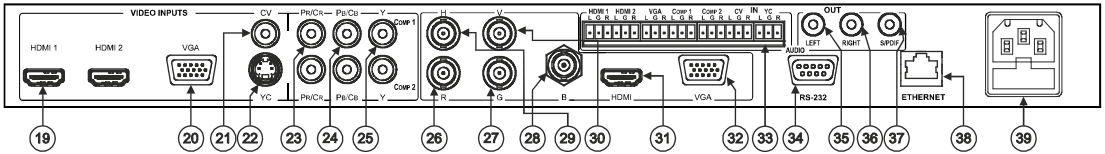


Figure 2: VP-441 Presentation Switcher/Scaler Rear Panel

#	Feature		Function
19	*VIDEO INPUT* Connectors	*HDMI*	Connect to the HDMI source (from 1 to 2)
20		*VGA 15-pin HD*	Connect to the computer graphics source
21		*CV RCA*	Connect to the composite video source
22		*YC 4-pin*	Connect to the s-Video source
23		*Pr/Cr RCA*	Connect all three connectors to the component video source (from 1 to 2)
24		*Pb/Cb RCA*	
25		*Y RCA*	
26	*VIDEO OUTPUT* Connectors	*R BNC*	
27		*G BNC*	
28		*B BNC*	Connect to the RGBHV video acceptor
29		*H BNC*	
30		*V BNC*	
31		*HDMI*	Connect to the HDMI acceptor
32		*VGA 15-pin HD*	Connect to a VGA acceptor
33	*AUDIO IN* Unbalanced Stereo Terminal Block Connectors	*HDMI*	Connect to the analog audio HDMI source (from 1 to 2)
		VGA	Connect to the analog audio computer graphics source
		COMP	Connect to the analog audio component video source (from 1 to 2)
		CV	Connect to the analog audio composite video source
		YC	Connect to the analog audio s-Video source
34	*RS-232* 9-pin D-sub Port		Connect to the PC or the remote controller
35	*OUT RCA* Connectors	*LEFT*	Connect to the left stereo analog audio acceptor
36		*RIGHT*	Connect to the right stereo analog audio acceptor
37		*S/PDIF*	Connect to a digital audio acceptor
38	*ETHERNET* Connector		Connects to the PC or other Serial Controller through computer networking
39	Power Connector with Fuse		AC connector, enabling power supply to the unit

4 Installing in a Rack

This section provides instructions for rack mounting the unit.

Before installing in a rack, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0º to +55ºC (32º to 131ºF)
STORAGE TEMPERATURE:	-45º to +72ºC (-49º to 162ºF)
HUMIDITY:	10% to 90%, RHL non-condensing

CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.

2. Once rack mounted, enough air will still flow around the machine.

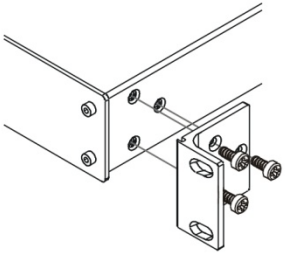
3. The machine is placed straight in the correct horizontal position.

4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.

5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

5 Connecting the VP-441

Always switch off the power to each device before connecting it to your **VP-441**. After connecting your **VP-441**, connect its power and then switch on the power to each device.

You do not have to connect all the inputs and outputs, connect only those that are required.

To connect the **VP-441**, as illustrated in the example in Figure 3, do the following:

1. Connect an HDMI source (for example, a DVD player) to the HDMI 1 VIDEO INPUT connector.
   Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the VP-441 via a DVI-HDMI adapter. When using this adapter, you can connect the audio signal via the terminal block connector
2. Connect a computer graphics source to the VGA 15-pin HD VIDEO INPUT connector.
3. Connect a composite video source (for example, a composite video player) to the CV VIDEO INPUT RCA connector.
4. Connect an s-Video source (for example, an s-Video player) to the YC 4-pin VIDEO INPUT connector.
5. Connect a component video source (for example, a component video player) to the COMP 1 P_R, P_B and Y, VIDEO INPUT RCA connectors.
6. Connect the audio input signals to the AUDIO IN terminal block connectors, as required (not shown in Figure 3).
7. Connect the RGBHV VIDEO OUTPUT BNC connectors to an RGBHV acceptor (for example, an RGBHV display).
8. Connect the HDMI VIDEO OUTPUT connector to an HDMI acceptor (for example, a plasma display).

9. Connect the VGA VIDEO OUTPUT 15-pin HD connector to a VGA acceptor (for example, a projector).

10. Connect the audio output signals to the OUT stereo analog audio acceptor and/or the digital audio acceptor, as required (not shown in Figure 3).

11. Connect the power cord (not shown in Figure 3).

12. If required, connect:

    - A PC via RS-232, see Section 6.3
    - The ETHERNET port, see Section 6.4

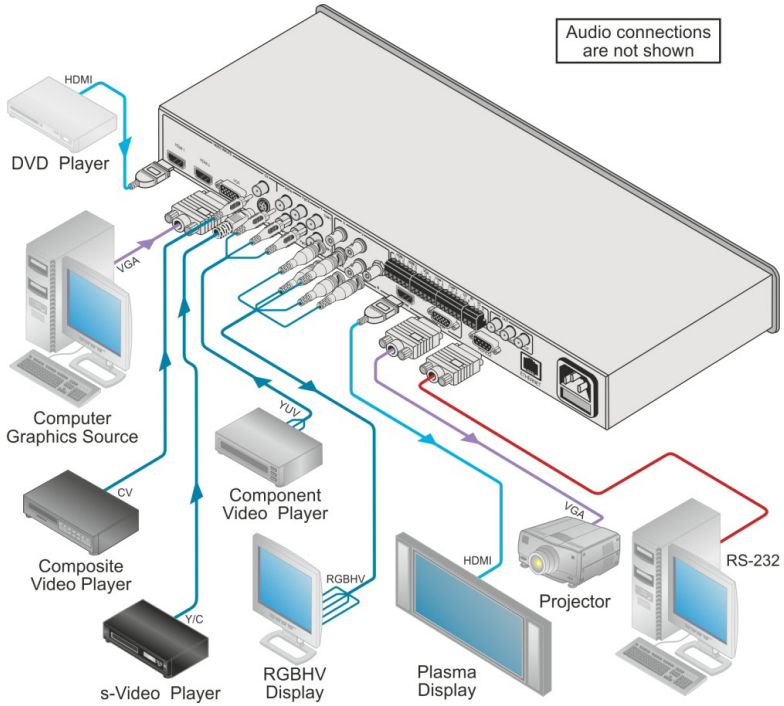


Figure 3: Connecting the VP-441 Presentation Switcher / Scaler

6 Controlling the VP-441

The **VP-441** can be controlled via:

- The front panel buttons (see Section 6.1)
- The OSD menu (see Section 6.2)
- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller (see Section 6.3)
- The ETHERNET (see Section 6.4)
- The infrared remote control transmitter (see Section 6.5)

6.1 Controlling via the Front Panel Buttons

The **VP-441** includes the following front panel buttons:

- Input selector buttons for selecting the required input: CV, YC, COMPONENT (1 and 2), VGA or HDMI (1 and 2)
- BLANK, MUTE and FREEZE buttons
- MENU, ENTER, and up, down, left and right arrow buttons
- RESET TO XGA/720p and PANEL LOCK buttons

6.1.1 The Auto Adjust (Auto Tune) Feature

The auto adjust feature (applies only to the VGA input) automatically centers the image on the screen when pressing the ENTER front panel button or the OK button on the remote control transmitter (when not within the OSD menu).

You can also implement this feature every time the input is switched to VGA or when the input resolution changes, via the FINETUNE menu (see Section 6.2.2).

6.2 Using the OSD Menu

The control buttons let you control the **VP-441** via the OSD menu. Press the:

- MENU button to enter the menu
  The default timeout is set to 10 seconds
- ENTER button to accept changes and to change the menu settings
- Arrow buttons to move through the OSD menu, which is displayed on the video output

On the OSD menu, select EXIT to exit the menu.

6.2.1 The MAIN MENU

<table>
<tr><th>Mode</th><th colspan="4">Function</th></tr>
<tr><td>CONTRAST</td><td colspan="4">Set the contrast
The range and default values vary according to the input signal</td></tr>
<tr><td>BRIGHTNESS</td><td colspan="4">Set the brightness
The range and default values vary according to the input signal</td></tr>
<tr><td>FINETUNE</td><td colspan="4">Optimize the image quality (see Section 6.2.2)</td></tr>
<tr><td>COLOR</td><td colspan="4">Set the red, green and blue shades (0 to 100, default 48, 48 and 52 respectively)</td></tr>
<tr><td>SIZE</td><td colspan="4">Select the size of the display: FULL, OVERSCAN, UNDER1, UNDER2, LETTER BOX, PANSCAN, BEST FIT (default, FULL)
UNDER1 refers to an underscan of 6%
UNDER2 refers to an underscan of 9%</td></tr>
<tr><td rowspan="7">SOURCE</td><td colspan="4">Select the source: (default VGA)</td></tr>
<tr><td>Source input</td><td>Appears as:</td><td>Source input</td><td>Appears as:</td></tr>
<tr><td>CV</td><td>CVBS</td><td>VGA</td><td>PC</td></tr>
<tr><td>YC</td><td>SVIDEO</td><td>HDMI 1</td><td>HDMI1</td></tr>
<tr><td>COMP 1</td><td>YPBPR1</td><td>HDMI 2</td><td>HDMI2</td></tr>
<tr><td>COMP 2</td><td>YPBPR2</td><td></td><td></td></tr>
<tr><td colspan="4">CVBS means Composite Video Baseband Signal</td></tr>
<tr><td rowspan="14">OUTPUT</td><td colspan="4">Select the output resolution from the menu (default NATIVE):</td></tr>
<tr><td>Output resolution:</td><td>Appears as:</td><td>Output resolution:</td><td>Appears as:</td></tr>
<tr><td>1080i @60Hz</td><td>1080I60</td><td>800x600</td><td>SVGA</td></tr>
<tr><td>1080p @60Hz</td><td>1080P60</td><td>1024x768</td><td>XGA</td></tr>
<tr><td>576i</td><td>576I</td><td>1280x1024</td><td>SXGA</td></tr>
<tr><td>576p</td><td>576P</td><td>1600x1200</td><td>UXGA</td></tr>
<tr><td>720p @50Hz</td><td>720P50</td><td>480i</td><td>480I</td></tr>
<tr><td>1080i @50Hz</td><td>1080I50</td><td>480p</td><td>480P</td></tr>
<tr><td>1080p @50Hz</td><td>1080P50</td><td>720p @50Hz</td><td>720P60</td></tr>
<tr><td>1280x800</td><td>1280x800</td><td>1600x900</td><td>1600x900</td></tr>
<tr><td>1680x1050</td><td>WSXGA</td><td>2048x1080 @50Hz</td><td>2048x1080/50Hz</td></tr>
<tr><td>1920x1200</td><td>WUXGA</td><td>2048x1080 @60Hz</td><td>2048x1080/60Hz</td></tr>
<tr><td>1440x900</td><td>WSXGA+</td><td>480i@59.94Hz</td><td>480I59</td></tr>
</table>

<table>
<tr><th>Mode</th><th colspan="4">Function</th></tr>
<tr><td></td><td>Output resolution:</td><td>Appears as:</td><td>Output resolution:</td><td>Appears as:</td></tr>
<tr><td></td><td>1400x1050</td><td>SXGA+</td><td>480p@59.94 Hz</td><td>480P59</td></tr>
<tr><td></td><td>1366x768</td><td>WXGA</td><td>720p@59.94Hz</td><td>720P59</td></tr>
<tr><td></td><td></td><td>NATIVE</td><td>1080i@59.94Hz</td><td>1080I59</td></tr>
<tr><td></td><td>640x480</td><td>VGA</td><td>1080p@59.94Hz</td><td>1080P59</td></tr>
<tr><td></td><td colspan="4">NATIVE - Select NATIVE to select the output resolution from the EDID of the connected HDMI monitor</td></tr>
<tr><td>AUDIO</td><td colspan="4">Adjust audio parameters (see Section 6.2.3)</td></tr>
<tr><td>OSD</td><td colspan="4">Set the OSD parameters: H POSITION, V POSITION, TIMER, BACKGROUND and DISPLAY (see Section 6.2.4)</td></tr>
<tr><td>HDCP ON INPUT</td><td colspan="4">Set to ON or OFF.
HDCP support can be enabled (ON) or disabled (OFF) for each of the HDMI inputs, allowing the source to transmit a non-HDCP signal if required</td></tr>
<tr><td>HDCP ON OUTPUT</td><td colspan="4">Select Follow Input or Follow Output to define whether the HDCP will follow the input or the output
When Follow Input is selected, the scaler changes its HDCP output setting (for the HDMI output) according to the HDCP of the input.
This option is recommended when the HDMI scaler output is connected to a splitter/switcher
When Follow Output is selected, the scaler matches its HDCP output to the HDCP setting of the HDMI acceptor to which it is connected.</td></tr>
<tr><td>FACTORY RESET</td><td colspan="4">Resets to the default parameters (resolution is set to XGA or 720p)
If you cannot see the display after factory reset, use the front panel Res. button to set the correct resolution: press continuously for 2 seconds to reset to XGA, or continuously for 5 seconds to reset to 720p</td></tr>
<tr><td>INFORMATION</td><td colspan="4">Displays the source, the input resolution, the output resolution and the software version</td></tr>
<tr><td>AUTO SYNC OFF</td><td colspan="4">Turn the auto sync ON/OFF. When ON, a short period after not detecting a valid video signal on the selected input, the unit will disable the H and V syncs on the analog outputs until a valid input is again detected</td></tr>
<tr><td>EXIT</td><td colspan="4">Select to exit the menu</td></tr>
</table>

6.2.2 The FINETUNE Menu

Input Signal	Parameter	Function
CV, YC, COMPONENT	HUE	Set the color hue
	SATURATION	Set the color saturation
	SHARPNESS	Set the sharpness of the picture
	NOISE REDUCTION	Select the noise reduction: OFF, HI, LOW and MID (middle)
	COLOR FILTER	Set to ON to enable color filtering
VGA	PHASE	Set the clock phase
	CLOCK	Set the clock frequency
	H-POSITION	Set the horizontal position of the picture
	V-POSITION	Set the vertical position of the picture
	AUTO TUNE	When set to ON, auto adjusts the image (centers it correctly on the screen) every time the input is switched to VGA or when the input resolution changes Alternatively, you can auto adjust the image by pressing the ENTER button when not within the OSD menu
	COLOR FILTER	Set to ON to enable color filtering
HDMI	COLOR FILTER	Set to ON to enable color filtering

COLOR FILTER may improve the output image for certain graphic cards where color fringing is seen.

6.2.3 The AUDIO Menu

Parameter	Function
OUTPUT VOLUME	Set the output volume (from 0 to 100) Not applicable for embedded HDMI inputs
INPUT VOLUME	Set the input volume (from 0 to 100) Not applicable for embedded HDMI inputs
DELAY	Select the audio delay time: OFF, 40ms, 110ms and 150ms
SOUND	Select the sound options: ON, MUTE
MUTE FOLLOWS	Select the action that will be followed by mute: **INDEPENDENT**: the audio muting is independent of the FREEZE and BLANK functions **FREEZE** **BLANK** **FREEZE/BLANK**: when freezing or blanking the video, the audio will be muted (the MUTE function follows the FREEZE and the BLANK functions)
HDMI AUDIO IN	Select: **AUTOMATIC**: the embedded audio on the HDMI input is selected for an HDMI signal, or the analog audio input is selected if the input is not HDMI (for example, for a DVI input signal) **EMBEDDED**: the embedded audio in the HDMI signal is selected **ANALOG**: the analog audio input is selected HDMI AUDIO IN is enabled only when one of the HDMI inputs is selected

6.2.4 The OSD Menu

Parameter	Function
H POSITION	Set the horizontal position of the OSD (from 0 to 100)
V POSITION	Set the vertical position of the OSD (from 0 to 100)
TIMER	Set the timeout period in seconds (from 5 to 100)
BACKGROUND	Set the OSD background between 0 (solid black) and 8 (transparent)
DISPLAY	Select the information shown on the screen during operation: **ON** - the information is shown permanently **OFF** - the information is not shown **INFO** - the information is shown for a few seconds

6.3 Connecting to the VP-441 via RS-232

You can connect to the **VP-441** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **VP-441** via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VP-441** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

6.4 Connecting the VP-441 via the ETHERNET Port

To connect and configure the Ethernet port of the **VP-441**, refer to the ETHERNET Configuration (Lantronix) GUIDE on our Web site:
http://www.kramerelectronics.com

6.5 Controlling via the Infrared Remote Control Transmitter

You can control the **VP-441** from the infrared remote control transmitter:

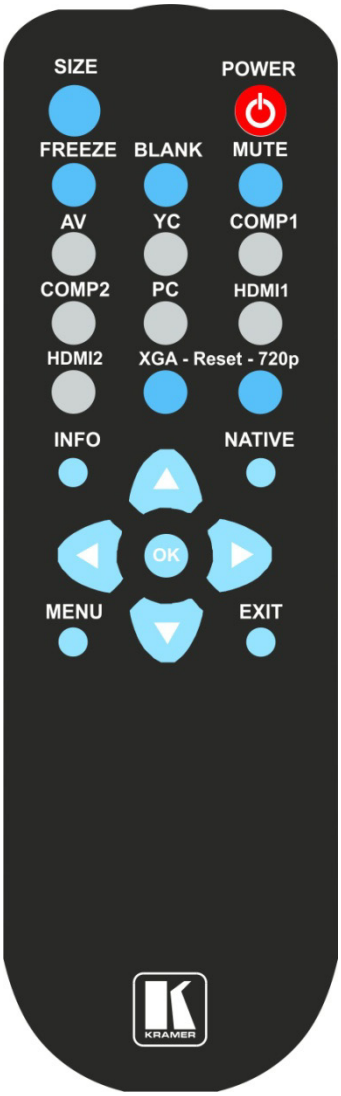
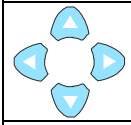


Figure 4: Infrared Remote Control Transmitter

Keys	Function
SIZE	Set the size of the image displayed
POWER	Turn the **VP-441** ON or OFF (the outputs and the front-panel are disabled)
FREEZE	Freeze/unfreeze the output video image
BLANK	Toggle between a blank screen (blue or black screen) and the display
MUTE	Toggle between muting (blocking out the sound) and enabling the audio output
AV	Select the composite video input
YC	Select the s-Video input
COMP1	Select the component video 1 input
COMP2	Select the component video 2 input
PC	Select the UXGA input
HDMI1	Select the HDMI1 input
HDMI2	Select the HDMI2 input
XGA Reset	Reset the resolution to XGA
720p Reset	Reset the resolution to 720p
INFO	Displays the selected input, the input and output resolutions and the firmware versions on the OSD
NATIVE	Select the output resolution via the EDID of the connected HDMI monitor
	Four navigation keys Left and right arrow keys also function as output volume control
OK	Press to accept changes Press also to auto adjust the picture (see Section 6.1.1)
MENU	Enter the OSD menu
EXIT	EXIT the menu

7 Technical Specifications

INPUTS:	2 HDMI connectors 1 VGA on a 15-pin HD connector 1 composite video on an RCA connector 1 Y/C on a 4-pin connector 2 component video each on 3 RCA connectors 2 HDMI, 1 VGA, 2 COMP, 1 CV, 1 Y/C unbalanced stereo audio on seven 3-pin terminal block connectors
OUTPUTS:	1 RGBHV on 5 BNC connectors 1 HDMI connector 1 VGA (RGBHV) on a 15-pin HD connector 1 S/PDIF on an RCA connector 1 unbalanced stereo audio on RCA connectors
H FREQUENCY:	15.63-90kHz
V FREQUENCY:	50-100Hz
RGB SYNCS:	H and V TTL separated syncs
RGB LEVEL:	1.2Vpp max, 75Ω load
XGA OUT LEVEL:	1.2Vpp max, 75Ω load
S/PDIF OUT LEVEL:	0.55Vpp constant
OUTPUT RESOLUTIONS:	Native, VGA, SVGA, XGA, SXGA, UXGA, 480i, 480p, 576i, 576p, 720p, 1080i, 1080p, WXGA, WSXGA, WUXGA, 1280x800, 1440x900, 1400x1050, 1600x900, 2048x1080/50Hz, 2048x1080/60Hz, 480i59.94, 480p59.94, 720p59.94, 1080i59.94, 1080p59.94
OUTPUT REFRESH RATE:	60Hz for computer graphics resolutions, 50/60Hz for HDTV resolutions
CONTROLS:	CV, YC, component 1, component 2, VGA, HDMI 1, HDMI 2, input selector buttons; blank, mute, freeze buttons; menu, enter, menu arrows, reset to XGA/720p, lock buttons, RS-232, Ethernet, IR
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
POWER SOURCE:	100-240V AC, 20VA max.
DIMENSIONS:	19" x 7" x 1U (W, D, H) rack mountable
WEIGHT:	2.7kg (6lbs) approx.
ACCESSORIES:	Power cord, rack “ears”, IR remote control
Specifications are subject to change without notice at http://www.kramerelectronics.com	

7.1 Input Resolutions

Resolution/Refresh Rate	CV/s-Video	Component	VGA	HDMI
480I/576I(NTSC/PAL)	Yes (480i30x2 / 576i25x2)	Yes	No	Yes
480P/576P	No	Yes	No	Yes
720P@(60/50)	No	Yes	No	Yes
1080I@(60/50)	No	Yes	No	Yes
1080P@(60/50)	No	Yes	No	Yes
1080P@(24/25/30)	No	Yes	No	Yes
480P/576P-RGB	No	No	Yes	Yes
720P@(60/50)-RGB	No	No	Yes	Yes
1080I@(60/50)-RGB	No	No	No	Yes
1080P@(60/50)-RGB	No	No	Yes	Yes
1080P@(24/25/30)-RGB	No	No	No	Yes
VGA@(60/67/72/75/85)	No	No	Yes	Yes
SVGA@(56/60/72/75)	No	No	Yes	Yes
XGA@(60/70/75)	No	No	Yes	Yes
SXGA@(60/75)	No	No	Yes	Yes
1280X960	No	No	Yes	Yes
1600X900@60	No	No	Yes	Yes
UXGA@60 (1600X1200)	No	No	Yes	Yes
WXGA@60(1280x800)	No	No	Yes	Yes
WXGA+@60(1440x900)	No	No	Yes	Yes
WXGA@60(1366x768)	No	No	Yes	Yes
SXGA+@60(1400x1050)	No	No	Yes	Yes
WSXGA@60(1680x1050)	No	No	Yes	Yes
WUXGA@60(1920x1200)	No	No	Yes	Yes
2K@50 (2048X1080)	No	No	Yes	Yes
2K@60 (2048X1080)	No	No	Yes	Yes

8 RS-232 Communication Protocol

The following is the COM port setting:

Baud Rate: 9600bps

Parity: None

Data Bits: 8bits

Stop Bits: 1bit

Set CTS Mode: Off

Set XON/XOFF: Off

Character Symbols Definitions	
Symbol	**Meaning**
☐	Space
[CR]	Carriage Return, ASCII code 0x0D
[LF] or >	Line Feed, ASCII code 0x0A

Set and Get Command

Set Command:

Type in: Y■Control_Type■Function■Param[CR]

Reply: Z■Control_Type■Function■Param[CR][LF]

Get Command:

Type in: Y■Control_Type■Function[CR]

Reply: Z■Control_Type■Function■Param[CR][LF]

When sending a command, a blank character may precede [CR] if desired

Example:

Example 1: set brightness value as 32

Send: Y■1■16■32[CR]

Reply: Z■1■16■32[CR][LF]

Example 2: get current output resolution. (2 = SVGA)

Send: Y■4■21[CR]

Reply: Z■4■21■2[CR][LF]

8.1 RS-232 Protocol Table

Control Type	Function	Param (for Set)	Function Description	Comment
0	0	N/A	SIZE button on remote control	
0	1	N/A	POWER button on remote control	
0	2	N/A	FREEZE button on remote control	
0	3	N/A	480p button on remote control	
0	4	N/A	576p button on remote control	
0	5	N/A	720p button on remote control	
0	6	N/A	1080i button on remote control	
0	7	N/A	1080p button on remote control	
0	8	N/A	VGA button on remote control	
0	9	N/A	SVGA button on remote control	
0	10	N/A	XGA button on remote control	
0	11	N/A	SXGA button on remote control	
0	12	N/A	WXGA button on remote control	
0	13	N/A	UXGA button on remote control	
0	14	N/A	INFO button on remote control	
0	15	N/A	UP button on remote control	
0	16	N/A	NATIVE button on remote control	
0	17	N/A	LEFT button on remote control	
0	18	N/A	OK button on remote control	
0	19	N/A	RIGHT button on remote control	
0	20	N/A	MENU button on remote control	
0	21	N/A	DOWN button on remote control	
0	22	N/A	EXIT button on remote control	
0	23	N/A	AV button on remote control	
0	24	N/A	YC button on remote control	
0	25	N/A	COMP1 button on remote control	
0	26	N/A	HDMI1 button on remote control	
0	27	N/A	HDMI2 button on remote control	
0	28	N/A	COMP2 button on remote control	
0	29	N/A	VGA button on remote control	
0	30	N/A	BLANK button on remote control	
0	31	N/A	MUTE button on remote control	
0	33	N/A	Auto adjust	FW V6.12
1: Set 2: Get	4	0~100	Color: Red	
1: Set 2: Get	5	0~100	Color: Green	
1: Set 2: Get	6	0~100	Color: Blue	
1: Set 2: Get	16	0~100	Brightness	

Control Type	Function	Param (for Set)	Function Description	Comment
1: Set 2: Get	17	0~100	Contrast	
1: Set 2: Get	25	0~100	Hue	
1: Set 2: Get	26	0~100	Sharpness	
1: Set 2: Get	29	0~100	Saturation	
1: Set 2: Get	33	0~100	Set an absolute volume for Output	
1: Set 2: Get	34	0~100	Set an absolute volume for Input	
0: Set	35	N/A	Volume down	
0: Set	37	N/A	Volume up	
1: Set 2: Get	41	0~100	OSD Setting :H-Position	
1: Set 2: Get	42	0~100	OSD Setting: V-Position	
1: Set 2: Get	43	0~100	OSD Timeout	
1: Set 2: Get	44	0~8	OSD Background	
1: Set 2: Get	50	0~3	NR (Noise Reduction)	0: Off 1: Low 2: Mid 3: High
1: Set 2: Get	51	0~3	Audio delay	0: Off 1: 40ms 2: 110ms 3: 150ms
1: Set 2: Get	52	0~2	HDMI AUDIO IN	0 : AUTOMATIC 1 : EMBEDDED 2 : ANALOG
1: Set 2: Get	84	(0~1)	Auto Sync Off	0 : OFF 1 : ON
1: Set 2: Get	160	0~1	HDCP ON INPUT	0 : OFF (FW : 1.05) 1 : ON
1: Set 2: Get	161	0~1	HDCP ON OUTPUT	0 : FOLLOW INPUT (FW :1.07) 1 : FOLLOW OUTPUT
3: Set 4: Get	0	1~7	Select Input Source	1: AV 2: YC 3: COMP1 4: COMP2 5: VGA 6: HDMI1 7: HDMI2
3: Set 4: Get	1	0~6	Size	0: Full 1: Panscan 2: Overscan

Control Type	Function	Param (for Set)	Function Description	Comment
				3: Underscan 4: Letterbox 5: Underscan2 6: Best Fit
3: Set 4: Get	21	0~29	Output Resolution	0: Native 1: VGA 2: SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800, 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600x900 (FW 1.32) 23: 2048x1080/50 24: 2048x1080/60 25: 480i59 26: 480p59 27: 720p59 28: 1080i59 29: 1080p59
3: Set	23	1	Factory Reset	
4: Get	24	0 ~ 24	INPUT Resolution	0: Unknown 1: VGA 2. SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50

Control Type	Function	Param (for Set)	Function Description	Comment
				16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600X900 23: 2048X1080/50 24: 2048X1080/60
6: Set 7: Geta	0	0~2	Power	0: Power Down 1: Power On 2: Reboot
6: Set 7: Get	1	0~1	Freeze	0: Off 1: On
6: Set 7: Get	2	0~1	Blank	0: Off 1: On
6: Set 7: Get	3	0~1	Mute	0: Off 1: On
6: Set 7: Get	4	0~1	Key lock	0: Off 1: On
6: Set 7: Get	140	0~1	Auto Tune (under fine tune)	0: clear Auto Tune 1: set auto Tune

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A “CONSUMER PRODUCT” UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at www.kramerelectronics.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-300040 Rev: 5